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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/615,112	07/08/2003	Thaddeus Schroeder	DP-309799	9110
7590	03/25/2005		EXAMINER	
JIMMY L. FUNKE DELPHI TECHNOLOGIES, INC. Legal Staff, Mail Code: 480-410-202 P.O. Box 5052 Troy, MI 48007-5052			SCHINDLER, DAVID M	
			ART UNIT	PAPER NUMBER
			2862	
DATE MAILED: 03/25/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/615,112	SCHROEDER ET AL.
	Examiner	Art Unit
	David Schindler	2862

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-14 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-14 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 08 July 2003 is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>07/08/03, 01/08/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

1. Claims 3, 4, 5, 7, 10, 11, 12, and 14 are objected to because of the following informalities:

As to Claim 3,

The phrase "the output signals" on line 2 lacks antecedent basis.

As to Claim 4,

Claim 4 is currently dependent on Claim 1, but this appears to be incorrect. The reason is that the circuit stage terminology is not present in Claim 1 and does not appear until Claim 2. For the purposes of examination, Claim 4 is assumed to be dependent on Claim 2.

As to Claim 5,

Claim 5 is currently dependent on Claim 1, but this appears to be incorrect. The reason is that the circuit stage terminology is not present in Claim 1 and does not appear until Claim 2. For the purposes of examination, Claim 5 is assumed to be dependent on Claim 2.

As to Claim 7,

Claim 7 is current dependent on Claim 1, but this appears to be incorrect. The reason is that the single circuit stage terminology is not present in Claim 1 and

does not appear until Claim 6. For the purposes of examination, Claim 7 is assumed to be dependent on Claim 6.

The phrase "the output signal" on line 2 lacks antecedent basis.

As to Claim 10,

The phrase "the output signals" on line 3 lacks antecedent basis.

As to Claim 11,

The term "the signals" on line 2 lacks antecedent basis and is unclear. It is not clear if the signals are being sent out or received by each circuit stage.

As to Claim 12,

The term "the signals" on line 2 lacks antecedent basis and is unclear. It is not clear if the signals are being sent out or received by each circuit stage.

As to Claim 14,

The phrase "the output signal" on line 3 lacks antecedent basis.

Claim 14 is current dependent on Claim 8, but this appears to be incorrect. The reason is that the single circuit stage terminology is not present in Claim 8 and does not appear until Claim 13. For the purposes of examination, Claim 14 is assumed to be dependent on Claim 13.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1 and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Siess (6,512,366).

Siess discloses a target wheel ((rotary element (2)), a pair of sensing elements (Figure 1) configured to generate respective signals as the wheel rotates in response to structure on the target wheel (Column 4, Lines 23-35), a first circuit (23) coupled to receive a signal from at least one of the sensing elements for detecting direction of rotation of the target wheel ((Column 6, Lines 59-63) and Figure 1), and a second circuit (10) coupled to receive each signal from the sensing elements for detecting position of the target wheel ((Figure 1) and (Column 4, Lines 36-41)).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2, 3, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Siess (6,512,366) in view of Shinjo et al. (6,630,821).

As to Claim 2,

Siess discloses as explained above.

Siess does not disclose the first circuit includes a pair of circuit stages, each of the stages coupled to respectively receive a signal from a respective one of the sensing elements.

Shinjo et al. discloses the first circuit includes a pair of circuit stages ((circuit stage one is considered to be (24) in combination with (29)) and (circuit stage two is considered to be (31) in combination with (36)), each of the stages coupled to respectively receive a signal from a respective one of the sensing elements ((Figure 2) and (Column 6, Lines 23-32)).

It would have been obvious at the time of the invention to modify Siess to include the first circuit includes a pair of circuit stages, each of the stages coupled to respectively receive a signal from a respective one of the sensing elements as taught by Shinjo et al. in order to obtain an output in the form of a change in voltage (Column 6, Lines 28-32).

As to Claim 3.

Siess does not disclose a flip-flop coupled to receive the output signals from the circuit stage pair for detecting direction of rotation to trigger a signal indicative of the direction of rotation of the target wheel.

Shinjo et al. discloses a flip-flop (38) coupled to receive the output signals from the circuit stage pair for detecting direction of rotation to trigger a signal indicative of the direction of rotation of the target wheel ((Figure 2) and (Column 8, Lines 25-27)).

It would have been obvious at the time of the invention to modify Siess to include a flip-flop coupled to receive the output signals from the circuit stage pair for detecting direction of rotation to trigger a signal indicative of the direction of rotation of the target wheel as taught by Shinjo et al. in order to have a circuit of simple arrangement that can detect moving direction (Column 4, Lines 38-40).

As to Claim 9.

Siess does not disclose coupling the first circuit includes coupling a pair of circuit stages, each of the stages coupled to respectively receive a signal from a respective one of the sensing elements.

Shinjo et al. discloses coupling the first circuit includes coupling a pair of circuit stages ((circuit stage one is considered to be (24) in combination with (29)) and (circuit stage two is considered to be (31) in combination with (36)), each of the stages coupled to respectively receive a signal from a respective one of the sensing elements ((Figure 2) and (Column 6, Lines 23-32)).

It would have been obvious at the time of the invention to modify Siess to include coupling the first circuit includes coupling a pair of circuit stages, each of the stages coupled to respectively receive a signal from a respective one of the sensing elements as taught by Shinjo et al. in order to obtain an output in the form of a change in voltage (Column 6, Lines 28-32).

As to Claim 10.

Siess does not disclose triggering a signal indicative of the direction of rotation of the target wheel in response to a timing relationship between the output signals from the circuit stage pair.

Shinjo et al. discloses triggering a signal indicative of the direction of rotation of the target wheel in response to a timing relationship between the output signals from the circuit stage pair ((Figure 2) and (Column 8, Lines 25-27) and (Column 4, Lines 42-50)).

It would have been obvious at the time of the invention to modify Siess to include triggering a signal indicative of the direction of rotation of the target wheel in response to a timing relationship between the output signals from the circuit stage pair as taught by Shinjo et al. in order to have a circuit of simple arrangement that can detect moving direction (Column 4, Lines 38-40).

6. Claims 4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Siess (6,512,366) in view of Shinjo et al. (6,630,821) and in further view of Schroeder (6,291,989).

As to Claim 4,

Siess in view of Shinjo et al. discloses as explained above.

Siess in view of Shinjo et al. does not disclose each circuit stage for sensing direction of rotation includes a peak and valley detector.

Schroeder discloses each circuit stage ((circuit stage one is considered to be

MR1' in combination with (36a)) and (circuit stage two is considered to be MR2' in combination with (36b))) for sensing direction of rotation includes a peak and valley detector ((Figure 5B) and (Column 7, Lines 24-37) and (Column 6, Lines 50-59)).

It would have been obvious at the time of the invention to modify Siess in view of Shinjo et al. to include each circuit stage for sensing direction of rotation includes a peak and valley detector as taught by Schroeder in order to sense position from the passage of single tooth edges of a target wheel (Column 1, Lines 12-14).

As to Claim 11.

Siess in view of Shinjo et al. discloses as explained above.

Siess in view of Shinjo et al. does not disclose detecting peaks and valleys in the signals received by each circuit stage.

Schroeder discloses detecting peaks and valleys in the signals received by each circuit stage ((Figure 5B) and (Column 7, Lines 24-37)).

It would have been obvious at the time of the invention to modify Siess in view of Shinjo et al. in order to sense position from the passage of single tooth edges of a target wheel (Column 1, Lines 12-14).

7. Claims 5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Siess (6,512,366) in view of Shinjo et al. (6,630,821) in view of Baker et al. (4,533,902).

As to Claim 5.

Siess in view of Shinjo et al. discloses as explained above.

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Siess in view of Shinjo et al. does not disclose each circuit stage for sensing direction of rotation includes a zero-crossings detector.

Baker et al. discloses each circuit stage ((circuit stage one is considered to be (10) in combination with (32)) and (circuit stage two is considered to be (11) in combination with (31))) for sensing direction of rotation includes a zero-crossings detector ((Figure 3A) and (Abstract, Lines 1-17)).

It would have been obvious at the time of the invention to modify Siess in view of Shinjo et al. to include each circuit stage for sensing direction of rotation includes a zero-crossings detector as taught by Baker et al. in order to sum the zero crossings (Abstract, Lines 15-17).

As to Claim 12,

Siess in view of Shinjo et al. discloses as explained above.

Siess in view of Shinjo et al. does not disclose detecting zero crossings in the signals received by each circuit stage.

Baker et al. discloses detecting zero crossings in the signals received by each circuit stage ((circuit stage one is considered to be (10) in combination with (32)) and (circuit stage two is considered to be (11) in combination with (31))) ((Figure 3A) and (Abstract, Lines 1-17)).

It would have been obvious at the time of the invention to modify Siess in view of Shinjo et al. to include detecting zero crossings in the signals received by each circuit stage as taught by Baker et al. in order to sum the zero crossings (Abstract, Lines 15-17).

8. Claims 6, 7, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Siess (6,512,366) in view of Render et al. (4,331,917).

As to Claim 6,

Siess discloses as explained above.

Siess does not disclose the first circuit includes a single circuit stage coupled to receive a signal from a respective one of the sensing elements.

Render et al. discloses the first circuit includes a single circuit stage (the single circuit stage is considered to be the combination of (14A) and (16) and ((18)) coupled to receive a signal from a respective one of the sensing elements (Figure 1).

It would have been obvious at the time of the invention to modify Siess to include the first circuit includes a single circuit stage coupled to receive a signal from a respective one of the sensing elements as taught by Render et al. in order to monitor direction of rotation of a rotating body ((Column 2, Lines 33-36) and (Abstract, Lines 1-2)).

As to Claim 7,

Siess does not disclose a flip-flop coupled to receive the output signal from the single circuit stage and an output signal from the second circuit to trigger a signal indicative of the direction of rotation of the target wheel.

Render et al. discloses a flip-flop (30) coupled to receive the output signal from the single circuit stage (the single circuit stage is considered to be the combination of (14A) and (16) and ((18))) and an output signal from the second circuit (the combination

of (14B) and (22) and (24)) to trigger a signal indicative of the direction of rotation of the target wheel ((Column 2, Lines 66-68) and (Column 3, Lines 1-3)).

It would have been obvious at the time of the invention to modify Siess to include a flip-flop coupled to receive the output signal from the single circuit stage and an output signal from the second circuit to trigger a signal indicative of the direction of rotation of the target wheel as taught by Render et al. in order to monitor direction of rotation of a rotating body ((Column 2, Lines 33-36) and (Abstract, Lines 1-2)).

As to Claim 13.

Siess does not disclose coupling the first circuit includes coupling a single circuit stage to receive a signal from a respective one of the sensing elements.

Render et al. discloses coupling the first circuit includes coupling a single circuit stage (the single circuit stage is considered to be the combination of (14A) and (16) and ((18)) to receive a signal from a respective one of the sensing elements (Figure 1).

It would have been obvious at the time of the invention to modify Siess to include coupling the first circuit includes coupling a single circuit stage to receive a signal from a respective one of the sensing elements as taught by Render et al. in order to monitor direction of rotation of a rotating body ((Column 2, Lines 33-36) and (Abstract, Lines 1-2)).

As to Claim 14.

Siess does not disclose triggering a signal indicative of the direction of rotation of the target wheel in response to a timing relationship between the output signal from the single circuit stage and the second circuit.

Render et al. discloses triggering a signal indicative of the direction of rotation of the target wheel in response to a timing relationship between the output signal from the single circuit stage (the single circuit stage is considered to be the combination of (14A) and (16) and ((18)) and the second circuit (the combination of (14B) and (22) and (24)) ((Column 2, Lines 49-68) and (Column 3, Lines 1-3)).

It would have been obvious at the time of the invention to modify Siess to include triggering a signal indicative of the direction of rotation of the target wheel in response to a timing relationship between the output signal from the single circuit stage and the second circuit as taught by Render et al. in order to monitor direction of rotation of a rotating body ((Column 2, Lines 33-36) and (Abstract, Lines 1-2)).

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Pat. No. 6,346,808 to Schroeder which discloses a target wheel and a position sensor with two magnetoresistors.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Schindler whose telephone number is (571) 272-2112. The examiner can normally be reached on M-F (8:00 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DS
David Schindler

Jay Patidar
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PRIMARY EXAMINER